IMBS 1 **ISCID-CO Dunkerque/ULCO**

Mathematics applied to economics and management

Foundations of Descriptive and Inferential Statistics

October 2015 - Continuous assessment - Semester 1

Time allowed : 1h00 - All documents allowed

Exercice 1 For each question, indicate only one answer (or your answer will be counted as incorrect) and the commands in `R` you need to use to get the answer. There is no penalty for incorrect answers.

Questions 1. to 3. are based on the following sample of ages (in months) of 18 children at a day care :

36, 42, 18, 32, 22, 22, 25, 29, 30, 31, 19, 24, 35, 29, 26, 36, 24, 28

1. 1pt The median age of the children is
   (a) 29
   (b) 28.2
   (c) 30.5
   (d) 28.5
   (e) 31
2. 1pt The interquartile range for this data set is
   (a) 8
   (b) 12
   (c) 16
   (d) 20
   (e) 24
3. 1pt The standard deviation of the age of children is
   (a) 41.24
   (b) 11.33
   (c) 10.20
   (d) 6.42
   (e) 6.24

Consider the result of a fictional Stat 100 final exam taken by 120 students, as given in the following relative frequency distribution :

Grade	Less than 50	50-59	60-69	70-79	80-89	90-100
Frequency	15%	10%	30%	25%	15%	5%

4. 2pts How many students received at least a 70 on this exam ?
   (a) 54
   (b) 45
   (c) 25
   (d) 30
   (e) 66

5. [2pts] According to the empirical rule, approximately what percentage of normally distributed data lies within one standard deviation of the mean ?
   (a) 59%
   (b) 67%
   (c) 72%
   (d) 95%
   (e) 99.7%

Questions 6. to 9. are based on the following grouped frequency table of the income, x, of 30 employees at a local small business (in \$1000s).

Income	$26 < x \leq 28$	$28 < x \leq 30$	$30 < x \leq 32$	$32 < x \leq 34$	$34 < x \leq 36$
Frequency	2	11	8	5	4

6. [2pts] The relative cumulative frequency of the $28 < x \leq 30$ class is
   (a) 11
   (b) 0.43
   (c) 0.06
   (d) 13
   (e) 0.7
7. [1pt] The class that contains the 80-th percentile is :
   (a) $26 < x \leq 28$
   (b) $28 < x \leq 30$
   (c) $30 < x \leq 32$
   (d) $32 < x \leq 34$
   (e) $34 < x \leq 36$
8. [2pts] Using class-midpoints as representative values, we can estimate the mean for this data as :
   (a) $\$30,870$
   (b) $\$29,790$
   (c) $\$31,000$
   (d) $\$30,500$
   (e) $\$31,340$
9. [2pts] If the boss' income (the "31-st employee") is \$250,000, the mean income for all 31 workers is approximately equal to
   (a) $\$8,000$
   (b) $\$30,000$
   (c) $\$38,000$
   (d) $\$140,000$
   (e) $\$220,000$

Exercice 2 Examine the built in `ChickWeight` data (the help gives background about the data). The function split will prove useful to do the following (as will a script)

1. [2pts] Construct a plot of weight against time for chick number 34.
2. [2pts] For chicks in diet group 4, display box plots for each time point.
3. [2pts] Compute the mean weight for chicks in group 4, for each time point. Plot this mean value against time.